

Guardians of Pagscians: Enhancing Security System of Pagadian City Science High School

A STEM Project Proposal

Presented to

Schools Division Office-Pagadian City

Regional Office-IX, Zamboanga Peninsula

Department of Education

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SUMMARY

Ensuring safety and security of educational institutions has become paramount. Pagadian City Science High School (PAGSCI), like many other educational institutions, faces unique security challenges that require careful considerations and action. According to the SSLG of PAGSCI, the school has a population of 913 students in S.Y. 2023-2024. The enormity of the security system for students lies in the ever-evolving landscape of threats, both physical and digital, which constantly test the limits of our security measures. To sustain the security of the students, we proposed the (TITLE). This project utilizes microchips for student identification. In the past school years the students have relied on conventional methods such as ID cards, which can be prone to issues like loss, theft, or unauthorized use. However, this project seeks to mitigate these concerns and significantly enhance security by integrating microchips into our student identification processes. These microchips, equipped with cutting-edge biometric capabilities, offer a multifaceted and highly secure means of authentication. Each student is provided with a uniquely encoded microchip, which, when activated, enables seamless and foolproof identification. The microchip technology employed here is not only highly accurate but also tamper-resistant, ensuring that the identity verification process remains robust and impervious to unauthorized manipulation. This technology is designed with privacy and data security in mind. The information stored on these microchips is encrypted and securely managed, aligning with stringent data protection standards and regulations. It guarantees that sensitive student data remains confidential and inaccessible to unauthorized parties, assuaging any concerns about privacy breaches. This innovative approach not only enhances security but also streamlines various aspects of school life. From accessing school facilities and resources to managing attendance and participation

in extracurricular activities, the microchip-based identification system simplifies and optimizes daily operations, creating a more efficient and student-friendly environment.

BACKGROUND AND PROBLEM

The Philippines, an archipelago of diverse cultures and landscapes, faces a multifaceted security landscape characterized by a range of challenges. The issue of security systems in the country is of paramount importance due to its implications for the safety and well-being of its people, economic stability, and geopolitical relations Knight, J. (2002). Given that the country is also having security issues this implies the institutions are not exempted to this problem.

Pagadian City Science high school, famously known as Pagsci, is known for its achievements as well as its students' diverse social status (pagsciofficia). For this reason, the principal and teachers eagerly want to make a safe and ensuring place for their students to dwell and learn. However, not all educational institutions were made perfect; there are downsides. Traditionally, student identification systems and attendance systems have relied on conventional methods such as ID cards and manually writing in attendance sheets. An ID card is a portable display card bearing an individual's identification data. That means the ID card showcases a person's profile photo, full name, physical address, email address, contact number, and other basic information which can be prone to issues like loss, theft, or unauthorized use. Whilst manually writing in attendance sheets,

can be prone to issues like human error, time consuming, or cheating. Nevertheless, the Guardians of Pagscians project seeks to mitigate these concerns and significantly enhance security by integrating microchips into our student identification and attendance operation.

These microchips, equipped with cutting-edge biometric capabilities, offer a multifaceted and highly secure means of authentication. Each student is provided with a uniquely encoded microchip, which, when activated, enables seamless and foolproof identification. The microchip technology employed here is not only highly accurate but also tamper-resistant, ensuring that the identity verification process remains robust and impervious to unauthorized manipulation.

Moreover, this technology is designed with privacy and data security in mind. The information stored on these microchips is encrypted and securely managed, aligning with stringent data protection standards and regulations. It guarantees that sensitive student data remains confidential and inaccessible to unauthorized parties, assuaging any concerns about privacy breaches.

BENEFICIARIES

PAGSCI students were the main reason why (TITLE) was proposed. The project seeks to mitigate loss, theft, and unauthorized use concerns and significantly enhance security by integrating microchips into our student identification processes. This project aims to

Local residents, specifically those who live prone to flood areas, such as Zamboanga City, Pagadian City, Municipality of Tabina, Municipality of Molave, and Municipality of Buug will greatly benefit from this Ako BAHala Project. The project will control flood flow, mitigating its impacts. This study aims to prevent and lessen the effects of the past strong typhoon in 2020. Typhoon Vamco or 'Ulysses' is considered to be one of the most catastrophic typhoons in the country in the year 2020; intense flooding due to the typhoon caused fatalities, damage to properties and infrastructures, and devastating downpour in Manila and nearby provinces (Kurata et al., 2022). This will help residents maintain their occupations, businesses, activities, and livelihoods working. Disruption of economic activities will be prevented. Economic productivity in the localities will be ensured once this project is implemented. The safety and security of the citizens will also benefit from this because the project will enable them to live their daily lives without having to worry about how to survive and stay unassailable in times of typhoons. Flooding causes numerous problems, such as road closure, lack of access to markets and the like, and many more. Controlling the flow of flood water will surely make a difference; it will prevent many damages, disruptions, and accidents from happening.

PROPOSED SOLUTION

(TITLE) innovative system that aims to provide precise and tamper-resistant identification, reducing the vulnerabilities associated with traditional ID cards. It streamlines daily operations, making access and administrative tasks more efficient while safeguarding sensitive data. Ensuring the safety and security of students, faculty, and staff is a top priority at Pagadian City Science High School (PCSHS). To meet this challenge head-on, This project is proposing a groundbreaking solution: the implementation of advanced microchip biometrics. This innovative approach is set to redefine how we protect and identify individuals within our school premises, offering a comprehensive solution that addresses both security and operational efficiency.

At the heart of our proposal is the integration of cutting-edge microchip technology equipped with advanced biometrics capabilities. Each member of the PAGSCI community will be provided with a unique microchip embedded with biometric data, ensuring unparalleled accuracy in identification. Traditional ID cards, which are susceptible to loss, theft, or misuse, are no match for the robustness of this microchip biometrics system. The microchips are designed to resist tampering, providing an additional layer of security. Sensitive data stored on these microchips

will be encrypted, adhering to stringent data protection standards, guaranteeing the privacy of personal information.

Beyond enhancing security, this technology streamlines daily school operations. Students and staff can effortlessly access facilities and resources, manage attendance, and engage in extracurricular activities through a simple scan or biometric verification. This simplifies administrative tasks and elevates the overall experience for the PAGSCI community.

To this innovative system requires a thoughtful approach. With this project we can implement comprehensive education and awareness programs for students, staff, and parents. These programs will not only introduce the new system but also emphasize its significance in creating a safer and more efficient school environment.

In conclusion, PCSHS's proposal to introduce microchip biometrics represents a significant leap forward in terms of security, efficiency, and data protection. By embracing this advanced technology, PCSHS reaffirms its commitment to providing a secure and conducive learning environment. This innovative solution has the potential to serve as a model for educational institutions seeking to adapt to an ever-changing security landscape. As we embark on this transformative journey, we remain dedicated to the well-being of our students and the future of education, ensuring that PCSHS continues to be a safe haven for learning and growth.

Figure 2

Modified Plastic Shredder Design

Table 1

Cost Analysis: Modified Plastic Shredder

Material/Equipment	Description/Quantity	Cost
Tin Plain Washer	10 pieces, ½ size	140.00 peso
Threaded Rod	2 pieces, ¾ in quarter size	160.00 peso
Gear Motor	1 unit, 288:1 ratio, 600 in.-lbs. torque	700.00 peso
Marine Plywood	Ordinary, 2ft-4ft	300.00 peso
Ball Bearing	2 pieces	100.00 peso
Stick Glue	5 pieces	50.00 peso
18-volt Drill	1 unit	800.00 peso

Wood Screw	60 pieces	60.00 peso
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METHODS

This project can be done by any individual. The collection of recyclable tires and plastic garbage is the main step; the collection will mainly come from the Materials Recovery Facilities. The collected plastic garbage will then undergo shredding through the modified plastic shredding machine. Formation of the cube-shaped bag will be conducted before packing the 20 kilos worth of macroplastics.

To test the functionality of the flood barrier tool, there will be a functionality test to be conducted mainly in Zamboanga City and Pagadian City, the two most prone to flooding areas. 20 Ako BAHAla flood barrier tools shall be stacked together, fitting the area. Flood water will pass through the barrier tools. With the water passing through, proper testing shall start. The indicators of the flood barrier tool's functionality are product water volume, product water pressure, amount of macroplastics removed from the bag, and the distance away from the original area after flooding.

After the testing and collection of data from the functionality testing, data analysis of the data shall be done. Using the F-test, T-test, and Regression Analysis, data will be examined. The accuracy of the data collected shall be tested through Standard Error and Error Analysis calculation.

To further analyze and review the functionality of the barrier tool, help from local engineers and environmentalists will be required.

This project shall be implemented widely – throughout the entire region nine, especially in Zamboanga City and Pagadian City. Partnerships from the Department of Environment and Natural Resources, Department of Science and Technology, Green Peace Philippines, Rare Organization, and Mother Earth Foundation will be expected; with their support, this project will create a significant impact in many communities.

Figure 3

Independent Variable

Project Functionality

- 20-kilo Macroplastic
- 60-hole Rubber Tire Bag
- Number of Macroplastics
- Rubber Tire Bag Durability

Project Conceptual Framework

Dependent Variable

Flood Water Flow

- Flood Water Flow Volume
- Flood Water Flow Pressure
- Flood Water Flow Speed
- Amount of Flowing Garbage

Figure 4

Project Process Flow Chart

02

2-week Project Prototype and Plastic Shredder Machine Making

03

1-month Functionality Test in Zamboanga City and Pagadian City

04

Data Collection and Interpretation

05

Data Analysis

06

Standard Error and Error Analysis Calculation

07

Project Modification (only if applicable)

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